

A NEW GENUS AND SPECIES OF WATER SCAVENGER BEETLE,
GUYANOBIUS ADOCETUS, FROM GUYANA AND ITS LARVA
(COLEOPTERA: HYDROPHILIDAE: HYDROBIINAE)

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Abstract.—The adult of this new genus and species is described, illustrated with line drawings and scanning electron micrographs, and distinguished from related hydrobiine genera. The larva also is described, illustrated with line drawings, and distinguished from other hydrophilid larvae. The habitat of this species in the Takutu Mountains of Guyana is described.

The water scavenger beetle described here was collected during an Earthwatch expedition to the Takutu Mountains of Guyana in November–December 1983. The purpose of the fieldwork was to survey the insects of an area from which lumber was beginning to be selectively harvested. We also found that some small gold mining operations were underway in the same area. Consequently, siltation from road building, logging, and the mining operations had already caused some minor disturbances of the aquatic habitats but major portions remained undisturbed and numerous new taxa, including the one described below, were collected from them.

This new genus exemplifies the problem one finds in placing some new genera of hydrophilids in the proper subfamily and illustrates the value of using larval characteristics to help with assignments to higher categories. The habitus of the adult at first suggested an unusually large species of *Chaetarthria*, a new genus belonging to the subfamily Chaetarthriinae, perhaps related to *Chaetarthria* by its shape and similarity of habitat, or a small *Hydrobius* in the subfamily Hydrobiinae. When an attempt is made to key the adult to subfamily in the two keys now available for that purpose (d'Orchymont, 1942; Crowson, 1955), one finds that this beetle has some character states of both the Chaetarthriinae and Hydrobiinae.

Although this new hydrophilid superficially resembles the genus *Chaetarthria* by its strongly convex shape and the common excavation of the first two abdominal sterna, it differs as follows. (1) The elytra lack sutural striae. (2) The clypeus is broadly expanded and hides the thin, broad, truncate labrum. (3) The anterior margin of the first abdominal sternum has a few, fine, short setae instead of the long, dense, stout setae which extend over the excavations to the third sternum on *Chaetarthria*. (4) It is much larger in size than previously described species of *Chaetarthria*.

The small stream habitat was appropriate for either *Chaetarthria* or *Hydrobius*; but the presence of the beetles in leaf packs suggested *Hydrobius* instead of the normally psammophilous *Chaetarthria*.

The larva of this new genus is distinctly different from that of *Chaetarthria*; it keys readily to the Hydrobiinae in Bertrand's (1972) key to hydrophilid larvae and agrees well with Crowson's (1955) characterization of hydrobiine larvae. The larva of this new genus differs from that of *Chaetarthria* as follows. (1) Mandibles each with 3 teeth instead of 2 on inner edge. (2) Legs normally developed; tarsal claw present. (3) Ligula elongate, without proximal triangular plate and without a distal subcircular soft disc. (4) Labroclypeus with 5 large teeth instead of 3 teeth (1 large and 2 small).

Because of the differences between the adults and the convincing evidence the larva provides, this genus is here assigned to the Hydrobiinae.

Guyanobius Spangler, NEW GENUS

Body form hemispherical (Figs. 1-4). Length, 3.1 to 3.5 mm. Hypomera and epipleura vertical, extending well below sterna. Clypeus expanded anteriorly and laterally and conceals labrum; lateral margins extending deeply into eyes and narrowly separated from posterolateral margin of eyes (Figs. 2, 3). Antenna, 9 segmented (Fig. 10). Mentum shallowly concave and moderately emarginate apicomediaally. Maxillary palpi (Figs. 12, 13) 4 segmented, moderately short; ultimate segment about a third longer than penultimate segment; second (pseudobasal) segment with concavity toward the front; ultimate segment articulated toward mouth. Labial palpus, 3 segmented (Figs. 6, 7). Elytron without sutural stria. Prosternum short in front of procoxae (Fig. 3). Tarsal formula, 5-5-5 (Fig. 8). Protarsal claws broad and toothed at base (Figs. 8, 9). Basal segment of metatarsus shorter than second segment. Metatibia without fringe of long natatory setae. First abdominal sternum with longitudinal carina on midline; first and second sterna deeply concave, as in *Chaetarthria* and evident in some *Laccobius*, and sparsely punctate; sterna 3 to 5 densely punctate and pubescent; last sternum rounded apically, without apicomediaal emargination.

Type species of the genus.—*Guyanobius adocetus*, new species.

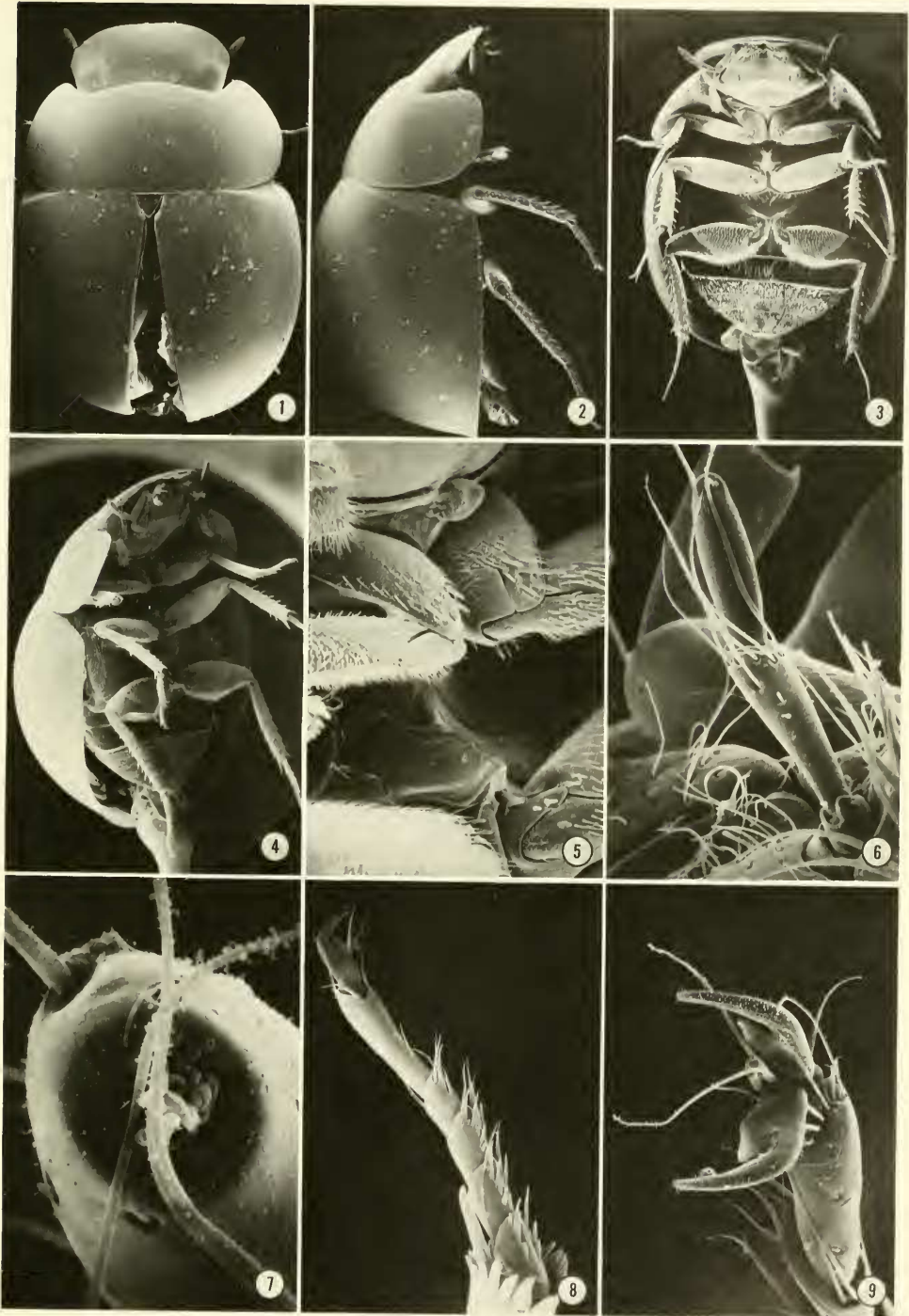
Etymology.—*Guyanobius*, from Guyana, the country in northeastern South America where the type specimen of this genus was collected, plus *bius* from bios, G. = life, because this genus forms a part of the fascinating biological diversity of that region. Gender: masculine.

Adults of the genus *Guyanobius* may be distinguished readily from those of other genera assigned to the Hydrobiinae by the presence of the following combination of character states. (1) Prosternum with distinct keel-like process on apicomediaal margin projecting beyond anterior margin of prosternum (Fig. 5) and another keel-like process (visible when disarticulated) on posteromediaal margin which rests in the notched apex of the mesosternum (Fig. 3). (2) Mesosternum with large, broad, triangular protuberance on basal half (Fig. 5). (3) First and second abdominal sterna excavated (Fig. 3) and often filled with a hyaline mass. (4) First abdominal sternum with longitudinal cariniform ridge on midline (Fig. 3). (5) Elytra without sutural stria. (6) Labrum hidden under expanded clypeus.

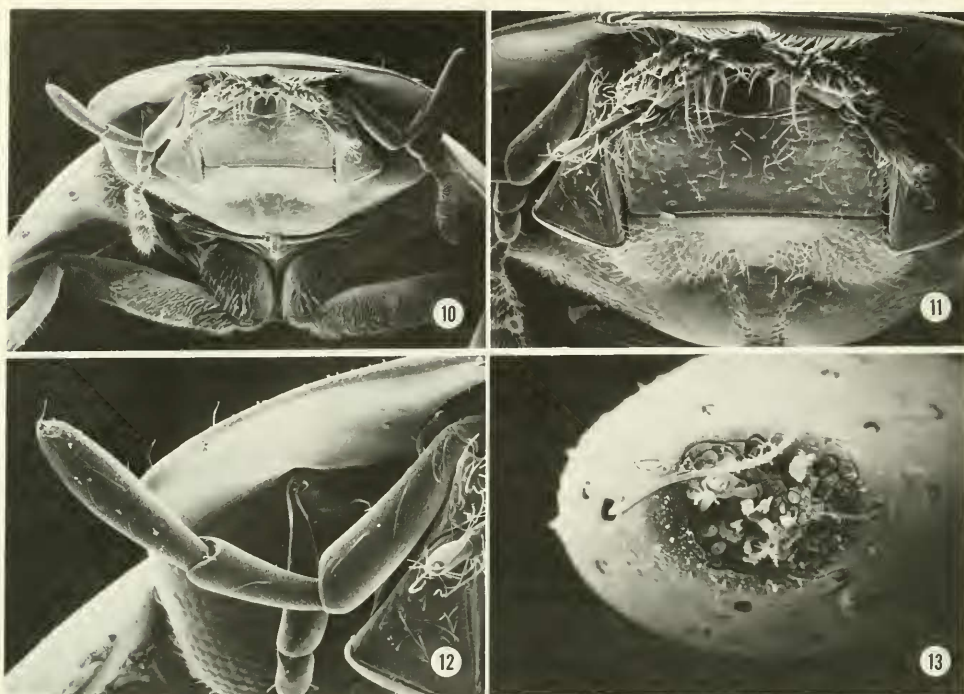
Guyanobius adocetus Spangler, NEW SPECIES

Figs. 1-24

Holotype male.—Form and size: Hemispherical, strongly convex dorsally (Figs. 1-4). Length, 3.5 mm; greatest width, 2.5 mm.



Figs. 1-9. *Guyanobius adocetus*, new species. 1, Habitus, dorsal view, 27 \times . 2, Habitus, lateral view, 27 \times . 3, Habitus, ventral view, 27 \times . 4, Habitus, oblique view, 27 \times . 5, Prosteral and mesosternal protuberances, 126 \times . 6, Labial palpus, 441 \times . 7, Sensilla, apex of labial palpus, 2890 \times . 8, Protarsus, 219 \times . 9, Protarsal claws, 550 \times .



Figs. 10–13. *Guyanobius adocetus*, new species. 10, Head and prosternum, 64 \times . 11, Mentum and submentum, 123 \times . 12, Maxillary palpus, 187 \times . 13, Sensilla, on apex of maxillary palpus, 1450 \times .

Coloration: Shiny black dorsally except narrow band on anterior margin of head, lateral margins of pronotum, and very narrow marginal bands on elytra dark reddish brown. Venter dark reddish brown except all palpi, maxillae, mentum, antennae, and tarsi slightly lighter reddish brown.

Head: Very finely, sparsely punctate; punctures on disc separated by 4 to 6 times their diameter; punctures across base of head between eyes smaller and sparser than discal punctures and separated by 3 or 4 times their diameter. Clypeus (Figs. 1–4, 10–12) strongly, broadly expanded anteriorly and laterally, concealing labrum (Figs. 10, 11); lateral margin extending deeply into eye (Fig. 2) and narrowly separated from posterolateral margin of eye; anterior margin feebly arcuate apicomediaally. Mentum shallowly concave, moderately broad, and moderately emarginate apicomediaally; surface moderately coarsely, sparsely punctate; punctures separated by 3 to 5 times their diameter. Submentum shallowly concave and densely, finely punctate; each puncture bearing a seta (Fig. 11).

Thorax: Pronotum widest at posterior third; strongly rounded laterally; shallowly emarginate and feebly arcuate apicomediaally (Fig. 1); truncate posteriorly; narrowly margined laterally and anterolaterally behind eyes; not margined posteriorly except posterolateral angles; sides nearly vertical, extending well below prosternum (Fig. 4); punctures on disc finer than and slightly more widely separated than discal punctures of head; most punctures separated by about 6 to 8 times their diameter; lateral punctures slightly coarser. Prosternum with distinct, keel-like, medial process on anterior third extending beyond anterior margin of

prosternum (Fig. 5) and another on posteromedial margin. Prosternal process very narrow, elongate. Mesosternum with moderately broad, triangular protuberance on posterior half between and slightly in front of mesocoxae (Fig. 5). Metasternum broadly triangularly raised medially; glabrous (except a few setae behind mesocoxae), shiny; sides shallowly concave; metepisterna pubescent. Procoxae sparsely finely setose laterally but with 6 very stout, darker setae ventroapically (Fig. 3). Profemora densely punctate and pubescent on basal two-thirds; mesofemora and metafemora, except apical fourth, densely punctate and pubescent (Fig. 3). Elytra with sides nearly vertical, extending well below mesosternum, metasternum, and abdominal sterna (Fig. 4); without sutural striae; very finely, sparsely punctate; punctures larger than those on pronotal disc and disarrayed except as follows. Each elytron with 2 rows of very coarse punctures and 1 lateral row of moderately coarse punctures extending from humeral area to apical fourth; punctures separated by 1 or 2 times their diameter; widely separated, seta-bearing punctures in 4 additional poorly defined rows, rows indicated by long setae which arise from punctures. Lateral margin of each elytron narrowly rimmed but rim disappearing at about apical fourth. Scutellum flat, triangular; surface finely, sparsely punctate; punctures separated by 3 to 5 times their diameter.

Abdomen: First and second sterna strongly concave and bearing a lens-shaped hyaline mass in concavities as in *Laccobius* and *Chaetarthria*; with coarse, sparse, seta-bearing punctures; punctures separated by 2 to 4 times their diameter. Remaining sterna finely and densely punctate and densely pubescent.

Male genitalia: As illustrated (Figs. 14, 15).

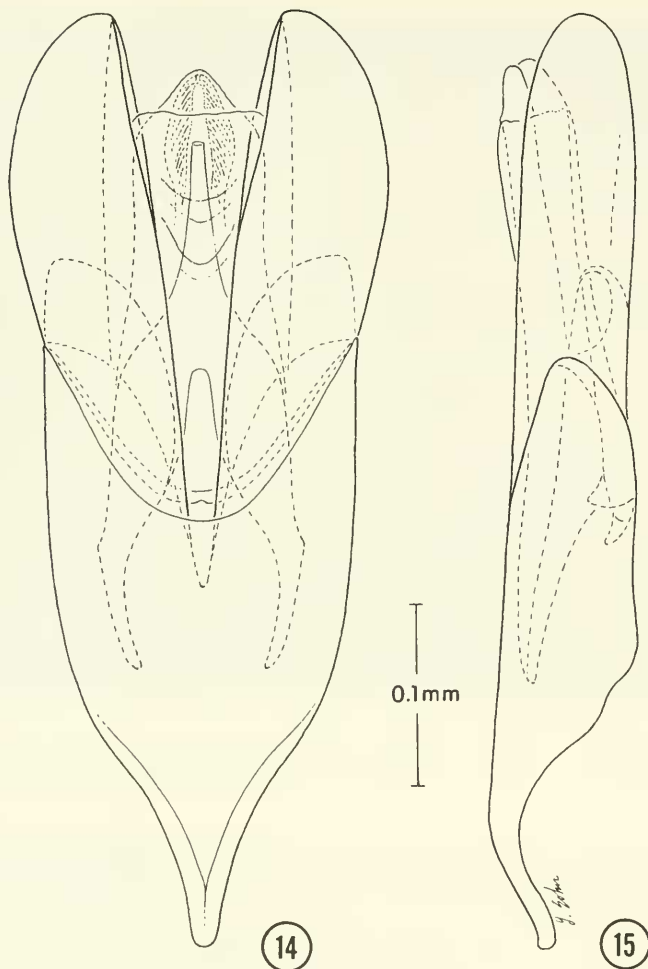
Female.—Similar to male except average size is larger.

Variations.—Males varied in length from 3.1 to 3.4 mm; females varied in length from 3.1 to 3.6 mm.

Type data.—Holotype ♂: GUYANA: MAZARUNI-POTARO DISTRICT: Takutu Mountains, 6°15'N, 59°5'W, 3–10 Dec. 1983, P. J. Spangler, R. A. Faitoute, P. D. Perkins; collected from leaf packs among rocks in shaded stream; deposited in the National Museum of Natural History, Smithsonian Institution. Allotype: Same data as holotype. Paratypes: Same data as holotype, 7 ♂, 8 ♀; same data as holotype except, 3–10 Dec. 1983, 11 ♂, 13 ♀; same data as holotype except, 18 Dec. 1983, P. J. Spangler, W. E. Steiner, and M. Levine, 30 ♂, 20 ♀. SURINAME: BROKOPONDO DISTRICT: Brownsberg Natuurpark, Witi Kreek, 200 m, 25 Aug. 1982, W. E. Steiner, 1 ♀. Paratypes will be deposited in the British Museum (Natural History), London; California Academy of Sciences, San Francisco; Canadian National Collection, Ottawa; Instituto de Zoología Agrícola, Facultad de Agronomía, Maracay, Venezuela; Institut Royal de Historie Naturelle de Belgique, Bruxelles; Museum National de Histoire Naturelle, Paris; Museo Argentina de Ciencias Naturales, Buenos Aires, and the Zoologische Sammlung Bayerischen Staates, München.

Etymology.—Named *adocetus*, from adoketos, G. = unexpected, because finding a hydrobiine beetle in a stream in the Takutu Mountain rainforest was a surprise.

Larva of *Guyanobius adocetus* (Figs. 16–24).—Body elongate (Fig. 16). Total length, 5.02 mm; width of prothorax, 0.89 mm. Color of integument light creamy yellow. Sclerotized head capsule, thoracic and abdominal sclerites, spiracles, legs, abdominal tubercles, and spiracular atrium testaceous. Integument covered dor-



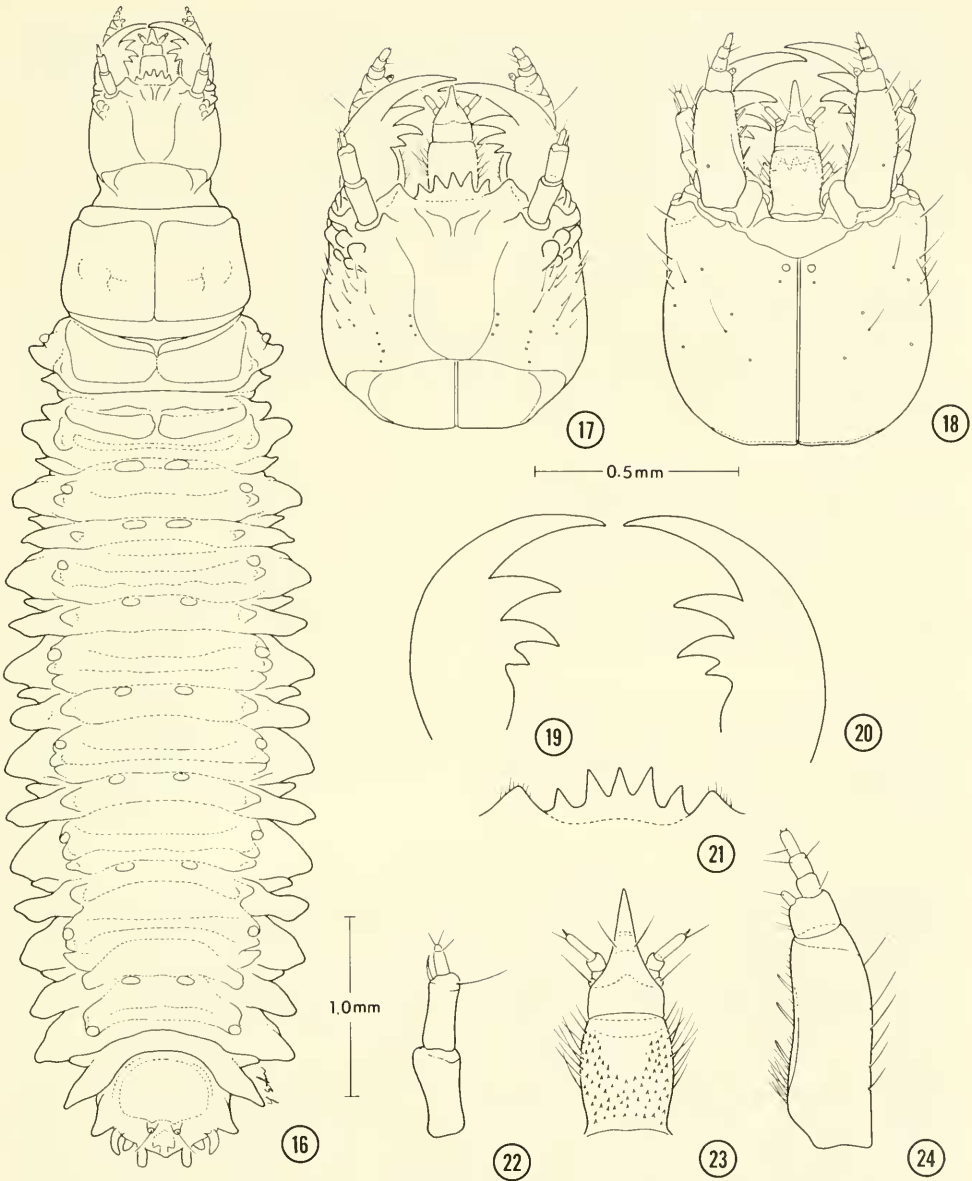
Figs. 14, 15. *Guyanobius adocetus*, new species; male genitalia. 14, Ventral view. 15, Lateral view.

sally with fine, whitish, branchiallike setae intermixed with irregularly spaced short dark asperities.

Head (Figs. 17, 18) quadrangular; 0.66 mm wide, 0.46 mm from labroclypeus to occipital foramen. Frontoclypeal suture feebly indicated. Frontal sutures united at base of head, therefore, without epicranial suture. Frons campanuliform. Cervical sclerites narrow, transverse, and triangular. Ventral surface of head glabrous except 8 setae anterolaterally below each ocellus and behind base of mandible; with 2 deep, posterior tentorial pits medially, a short distance behind gula.

Labroclypeus (Fig. 21) prominent, symmetrical. With 5 large, medial teeth; each lateral tooth slightly shorter than and separated more widely from other three. Middle tooth of labroclypeus slightly narrower than other teeth; each tooth separated from next tooth by a stout yellow seta. Anterolateral projections of epistoma as long as lateral teeth; both projections rounded anteriorly and each bearing numerous large, stout yellow setae apically.

Ocular area each with 6 distinct ocelli arranged in an ellipse; anterior 3 ocelli slightly larger than posterior 3.



Figs. 16–24. *Guyanobius adocetus*, new species, larva. 16, Habitus, dorsal view. 17, Head capsule, dorsal view. 18, Head capsule, ventral view. 19, Left mandible. 20, Right mandible. 21, Labroclypeus. 22, Antenna. 23, Labium. 24, Maxilla.

Antenna (Fig. 22) moderately short, cylindrical, extending almost to base of first segment of maxillary palpus. First and second segments subequal and each about twice as long as last segment; second segment with small apicolateral tubercle and 2 long slender apicomedia setae. Last segment slender, parallel sided, bearing 2 slender distal setae and a minute apicolateral appendage.

Mandible (Figs. 19, 20) symmetrical, prominent, stout, sharply pointed apically; inner surface of each mandible with 2 large, well-defined, medial teeth and 1 small, basal tooth; molar area rounded.

Maxilla (Fig. 24) with stipes stout, elongate, tapering distally; stipes bearing a row of 3 or 4 stout setae on inner margin, and 6 long, slender, yellow setae laterally. Palpifer segmentlike; with slender sclerotized appendage on apicomedial angle; appendage a third as long as palpifer and bearing 1 long apical seta. Palpus 4 segmented; tapering distally; first segment longest, twice as long as palpifer; second and third segment subequal, each slightly more than half as long as basal segment; second segment with 1 long, slender, lateral seta near base; last segment conical, slightly longer than third segment and bearing 1 long seta medially at midlength.

Labium (Fig. 23), including ligula, slightly longer than length of stipes. Ligula elongate, exceeding length of labial palpus. Labial palpus 3 segmented; first segment short and broad; last segment about as long as mentum, bearing a long basal seta at each lateral corner dorsally. Mentum quadrangular; glabrous dorsally; ventrally glabrous except apicolateral corners each with 1 long seta. Submentum slightly wider than mentum; dorsal surface spinose; with numerous, long, stout setae laterally; ventral surface glabrous except long apicolateral setae.

Gula short; transversely pentagonal; shallowly rounded posteromedially (Fig. 18). Two tentorial pits a short distance behind gula.

Prothorax with sides moderately arcuate; posterolateral angles broadly rounded, with a few short setae; anterolateral angles each with a few long setae and a few short setae; sagittal line present. Prosternal sclerite large, subrectangular; sagittal line present.

Mesothorax wider than prothorax and about two-thirds as long (measured on midline); with 2 large, rectangular mesotergal sclerites; laterally, each margin with an elongated spiracular tubercle between 2 setiferous lobes; sagittal line present.

Metathorax slightly wider than and as long as mesothorax; anterior metatergal sclerites short, transverse, subrectangular, larger than posterior sclerites; posterior sclerites small and narrow; sagittal line present.

Legs, 4 segmented. Procoxae large, separated by about length of a trochanter. Trochanter about as long as femur (viewed ventrally). Femur about as long as tibiotarsus. Tarsal claw single, with 2 stout robust setae ventrally at basal third.

Abdomen of 8 distinct segments; ninth and tenth segments reduced. First abdominal segment with 2 small, ovate sclerites; segments 2 to 7 also with similar sclerites but each becoming increasingly smaller. Terga similar to each other. True segmentation obscured by additional transverse folds on segments; segmented folds continued onto sternum. Each segment with 2 folds; numerous asperities scattered randomly over folds. A large spiracular tubercle present on first fold at base of epipleural lobe on abdominal segments 1 to 7. Epipleurites and hypopleurites prominently lobed. Eighth tergum represented by superior valve of stigmatic atrium (Fig. 16) beneath which lies the eighth pair of abdominal spiracles. Ninth tergum trilobed; middle lobe large, with several short, stout setae; lateral lobes smaller, about two-thirds as wide as median lobe, each bearing several short setae on caudal margin.

Larval specimens examined (11): The larvae, along with adults, were berlesed from leaf packs during a period of several days. They are deposited in the U.S. National Museum of Natural History, Smithsonian Institution and are labeled: GUYANA: MAZARUNI-POTARO DISTRICT: Takutu Mountains, 6°15'N, 59°5'W, 3-10 Dec. 1983, P. J. Spangler, R. A. Faitoute, and P. D. Perkins. The

larva of the genus described above keys to the hydrobiine genus *Limnoxenus*, couplet 30, in Bertrand's (1972) generic key to hydrophilid larvae. The genus *Limnoxenus* is treated by some authors (Balfour-Browne, 1958) as a synonym of *Hydrobius* and by others (Lohse, 1971) as a valid genus. D'Orchymont (1919) and Bertrand (1972) also question the validity of the genus. However, whether the genus *Limnoxenus* is valid or not is the subject for another study. For the present purpose the following couplet will separate the larva of *Guyanobius* from the larva of "*Limnoxenus*."

- Length of ligula exceeding length of labial palpus. Length of full grown larva 4 or 5 mm. Guyana and Suriname *Guyanobius* Spangler
- Length of ligula about half as long as labial palpus. Length of full grown larva 12 to 16 mm. Middle Europe, Hawaii, Australia, New Zealand *Limnoxenus* Rey

HABITAT

Adults and larvae of this genus were found living in leaf packs lodged against rocks and logs in and along the banks of a small, shallow, whitewater stream in a densely shaded rainforest. The stream was about 1 to 2 m wide, sloped from the bank to 30 cm in depth, and the substrate was sand, gravel, and rocks. Colorimetric water chemistry tests provided the following data: Oxygen, 9.0 ppm; pH, 5.5; and hardness, 5.0. The water temperature was 24.5°C when most of the specimens were collected.

Some specimens were aspirated from the leaf packs spread apart on a nylon ground cloth; other specimens were obtained by placing leaf packs in cloth berlese funnels for 24-48 hours.

ACKNOWLEDGMENTS

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NOTE

The Altitudinal Range of *Pogonomyrmex pima* (Formicidae: Hymenoptera)

In his book on the harvester ants of the genus *Pogonomyrmex*, Cole (1968, *Pogonomyrmex Harvester Ants. A Study of the Genus in North America*, Univ. Tenn. Press, Knoxville, 222 pp.) summarized the known range of *P. pima* Wheeler as southern Arizona in U.S.A. and Sonora in Mexico. Within that range nests have been found from sea level to elevations of 2400 feet. Following Creighton's view (1956, *Psyche* 63: 54–56) Cole proposed to ignore two localities cited for *pima* by Olsen (1934, *Bull. Mus. Comp. Zool.* 77: 493–514). One disputed record is Bowie, Arizona at 3700 feet. While curating miscellaneous undetermined *Myrmica* specimens in the Museum of Comparative Zoology, Harvard University, I found an unidentified *Pogonomyrmex* worker labeled from Bowie. Comparison with Cole's descriptions and series of identified *pima* and its closest relative *P. imberbiculus* Wheeler, showed without doubt that the specimen belongs to *pima*. Olsen's record is therefore confirmed and the altitudinal range of *pima* confirmed to some 4000 feet.

The other questioned record cited by Olsen (1934, *ibid.*), Mt. Lemmon, South Catalina Mts., Arizona, 8000–9000 feet, appears somewhat out of line, though not impossible. The specimen(s) involved could perhaps be found also in some part of the fragmented W. M. Wheeler Collection of ants.

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